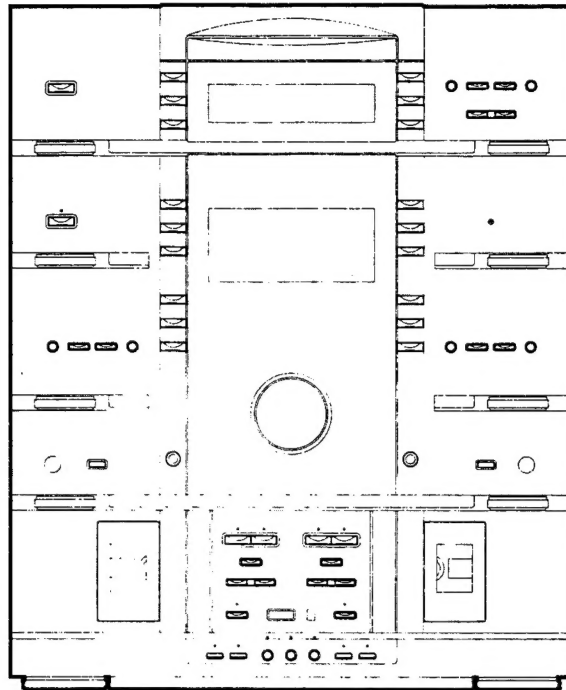


**VTC-CD151**



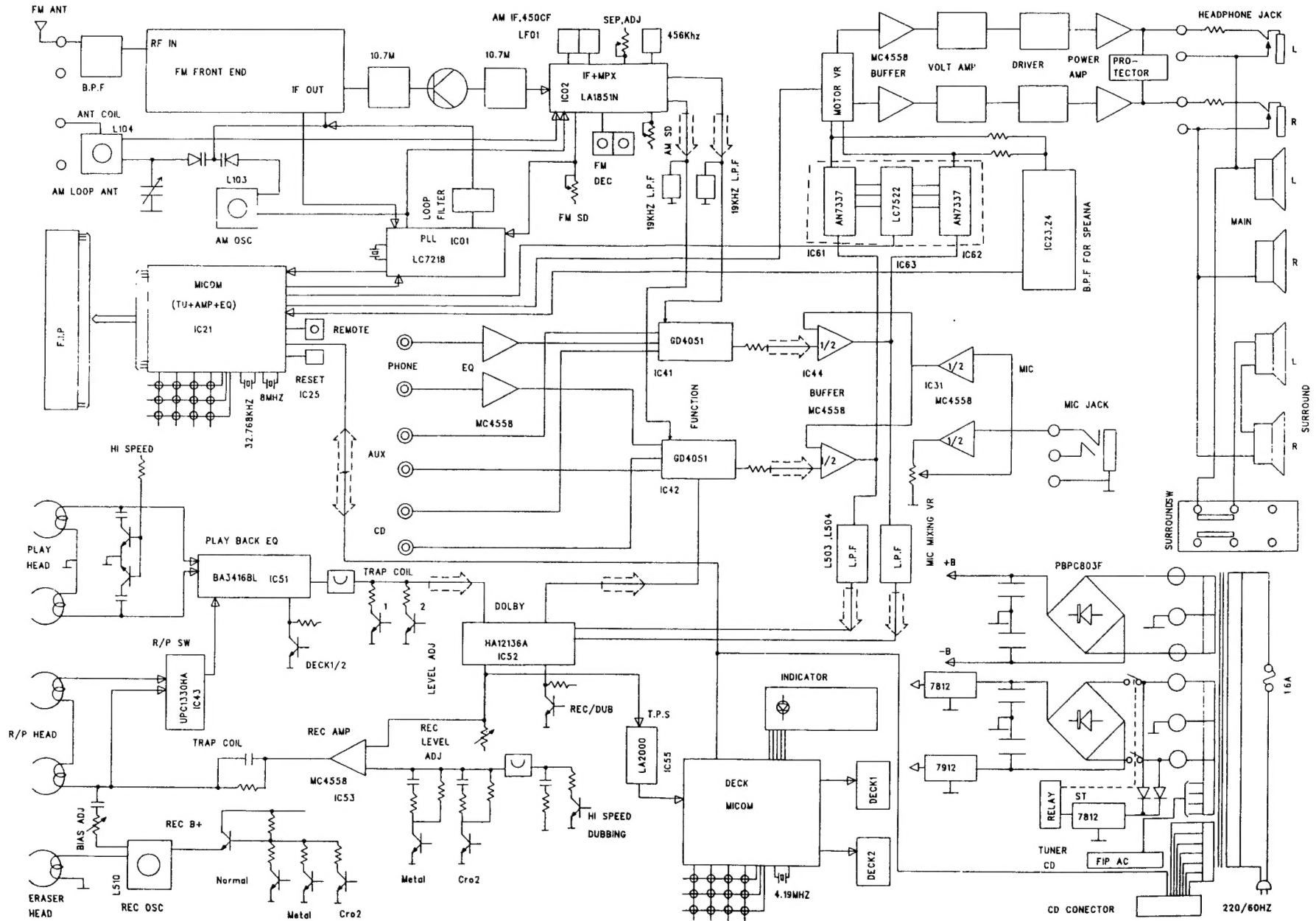
UTS-Nr.: 999 QUELLE  
Best.Nr.: 0370213/01  
Ger.Bez.: UNIV.POWER-PACK

GKz: G GERAET  
WGT: 652 POWERPACK  
KD-Sektor: R RUNDFUNK  
BaumNr.: 00 KEIN DIAGNOSEBAUM VORHANDEN  
Klassierung: STK STEREOKOMBINATION  
IFW-FehlerGru.: 205 RDF.,VERST.,TB.,PHONO,CD,CB  
Type/Privileg/Universum.Nr VTC-CD151  
Beschreibung  
VK-Preis: 1099.00

Serviceart: 01 QUELLE-TKD  
Garantie fuer Kunden 06 Monate  
Sondervereinbarungen: 0 SIEHE SERVICEART



## ■ BLOCK DIAGRAM



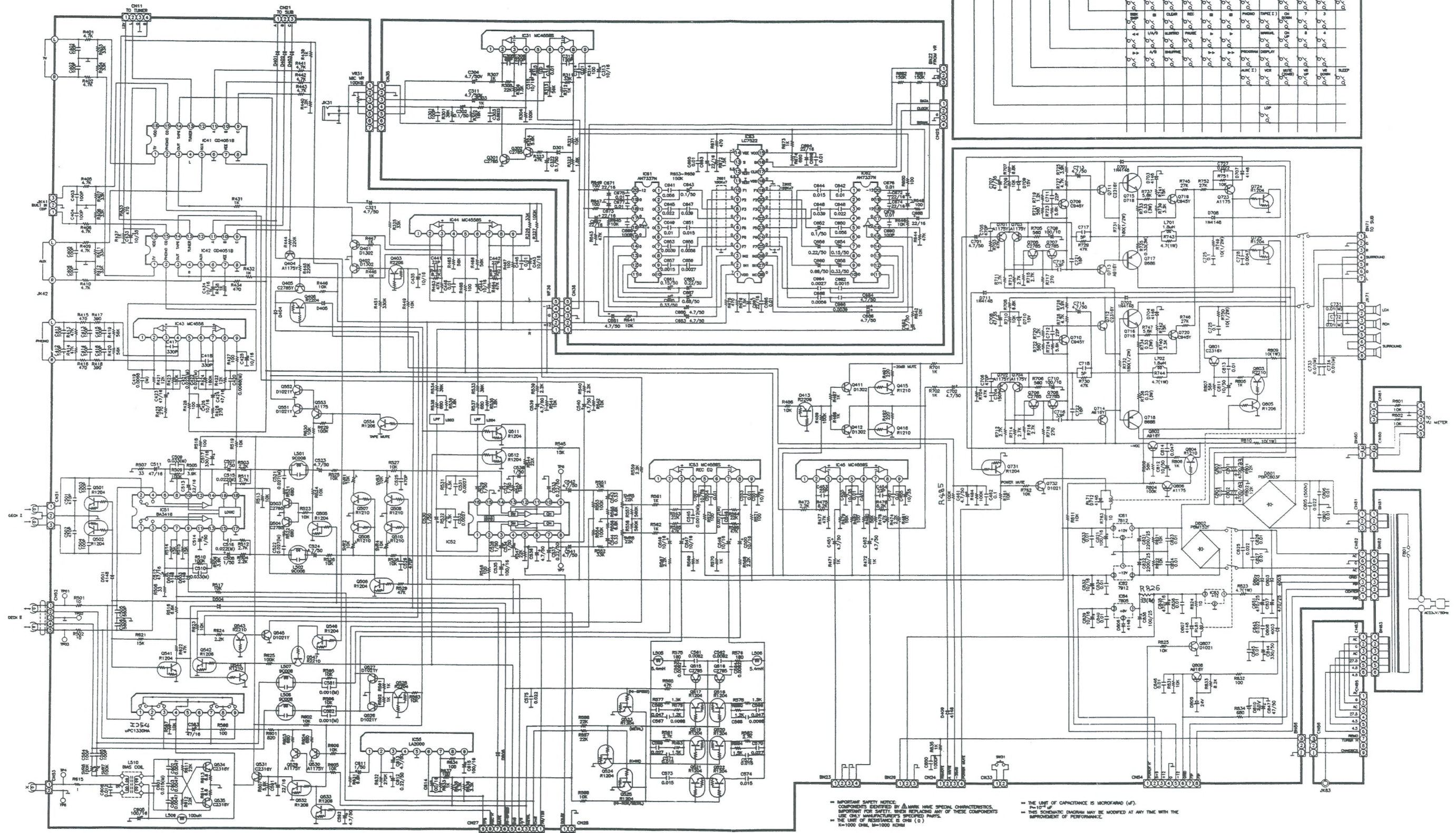


**IMPORTANT SAFETY NOTICE:**  
COMPONENTS IDENTIFIED BY \* HAVE SPECIAL CHARACTERISTICS.  
IMPORTANT FOR SAFETY: NEVER REPLACE ANY OF THESE COMPONENTS  
WITH AN EQUIVALENT PART.  
THE LIMIT OF RESISTANCE IS OHM ( $\Omega$ )  
K=1000 OHM, M=10000 OHM

**— THE UNIT OF CAPACITANCE IS MICROFARAD ( $\mu F$ ).  
— THIS SCHEMATIC DIAGRAM MAY BE MODIFIED AT ANY TIME WITH THE  
IMPROVEMENT OF PERFORMANCE.**

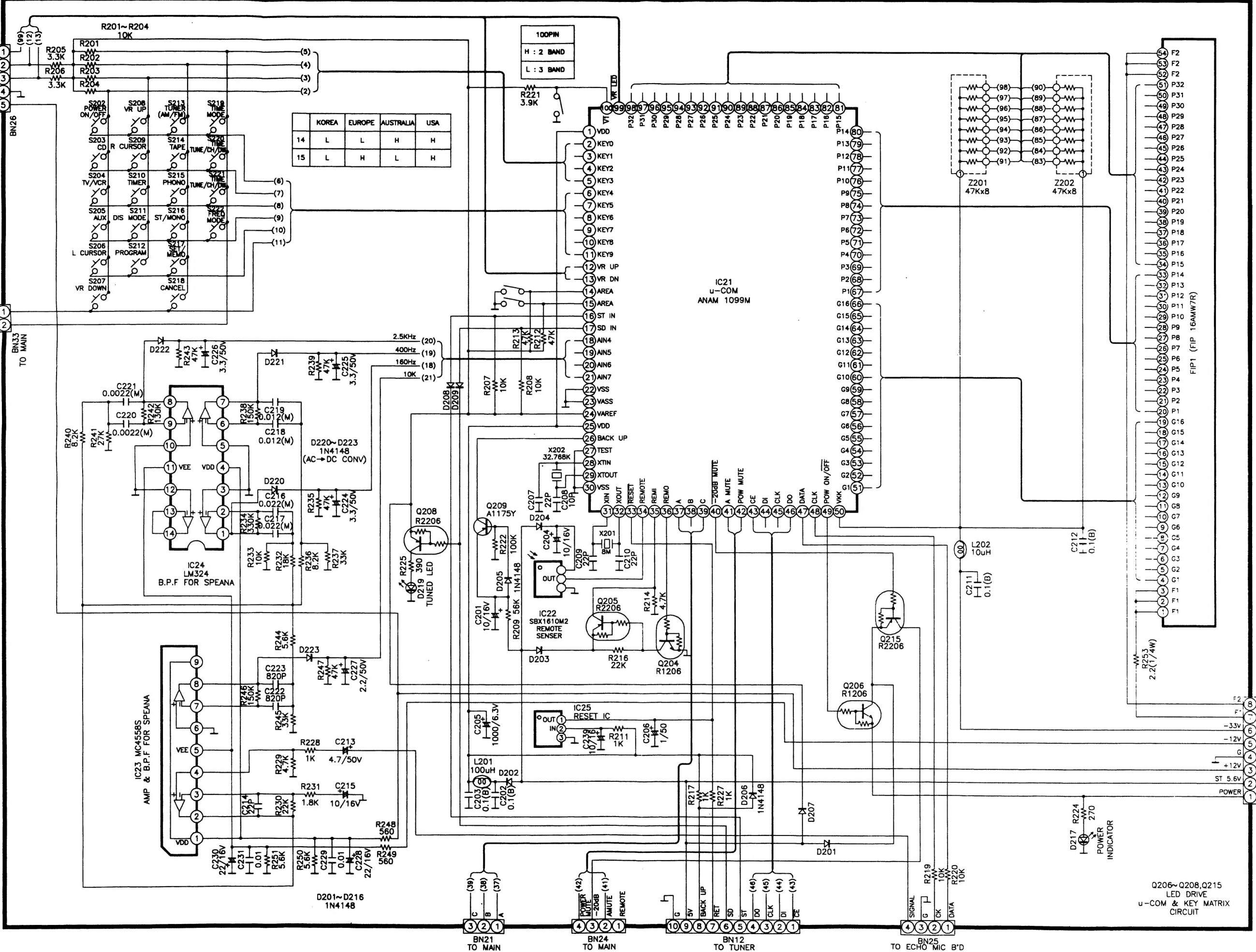


# ■ SCHEMATIC DIAGRAM (MAIN)



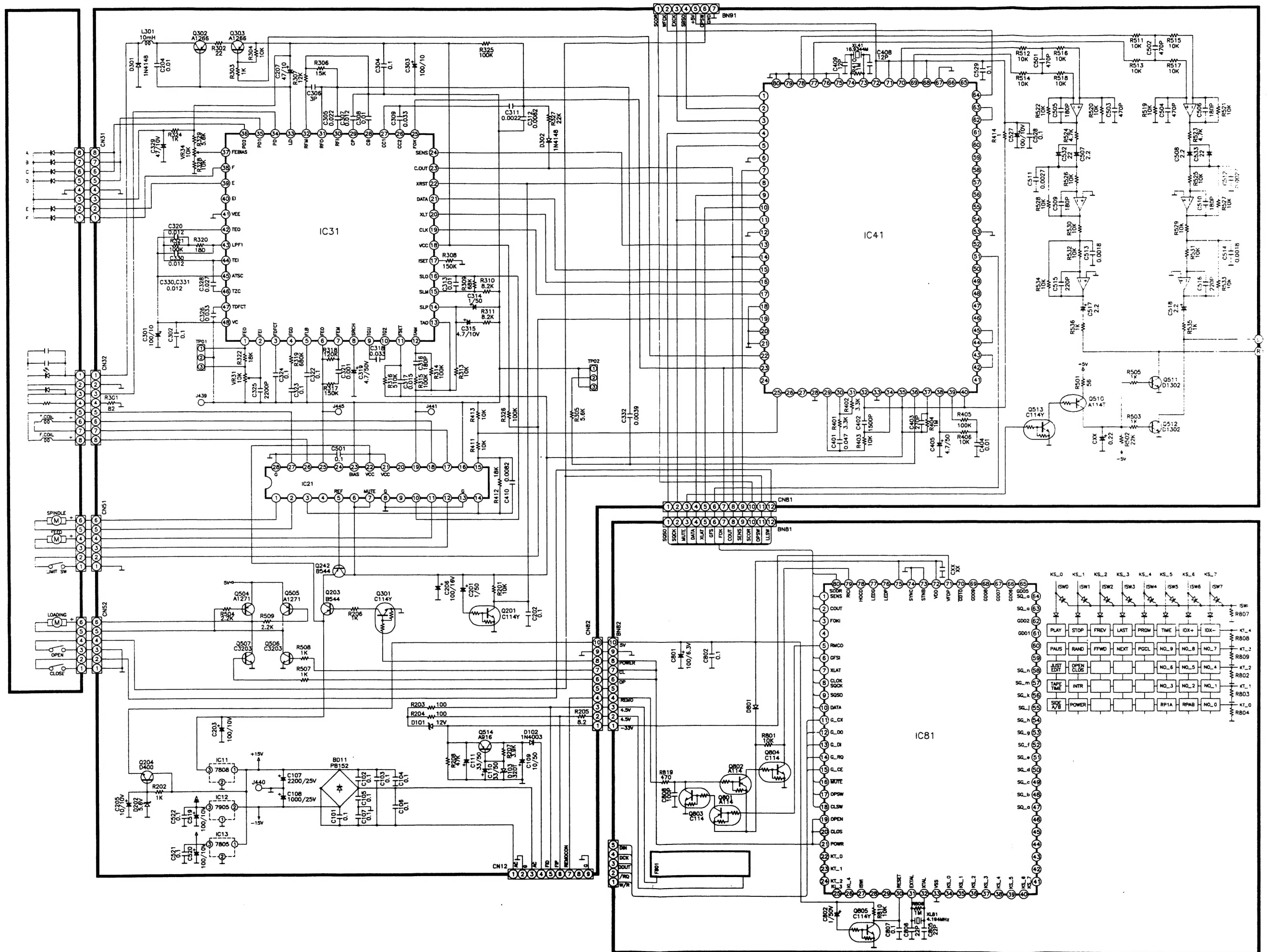


(SUB)





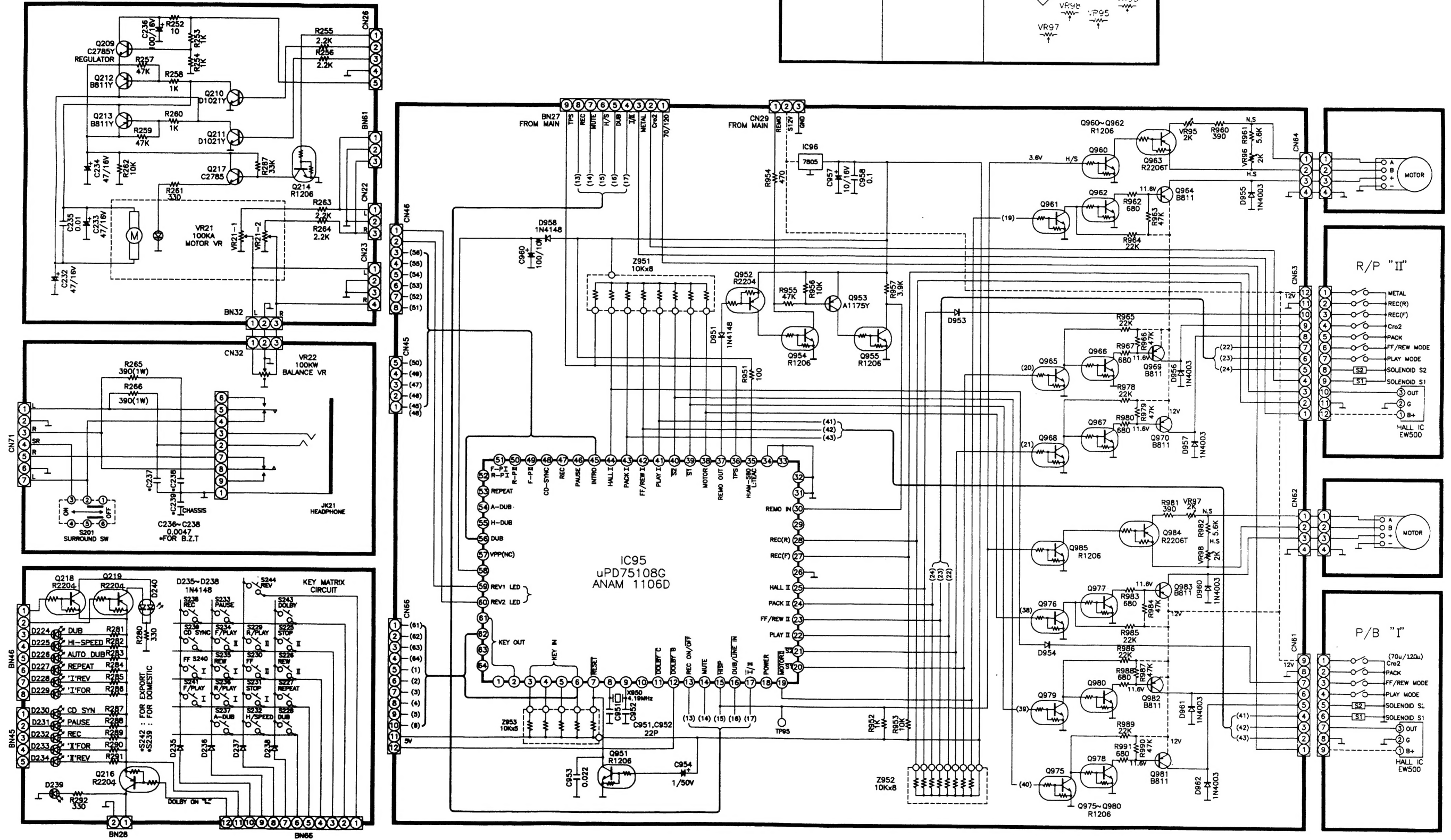
# ■ SCHEMATIC DIAGRAM





**(CONTROL)**

## CONTROL PCB





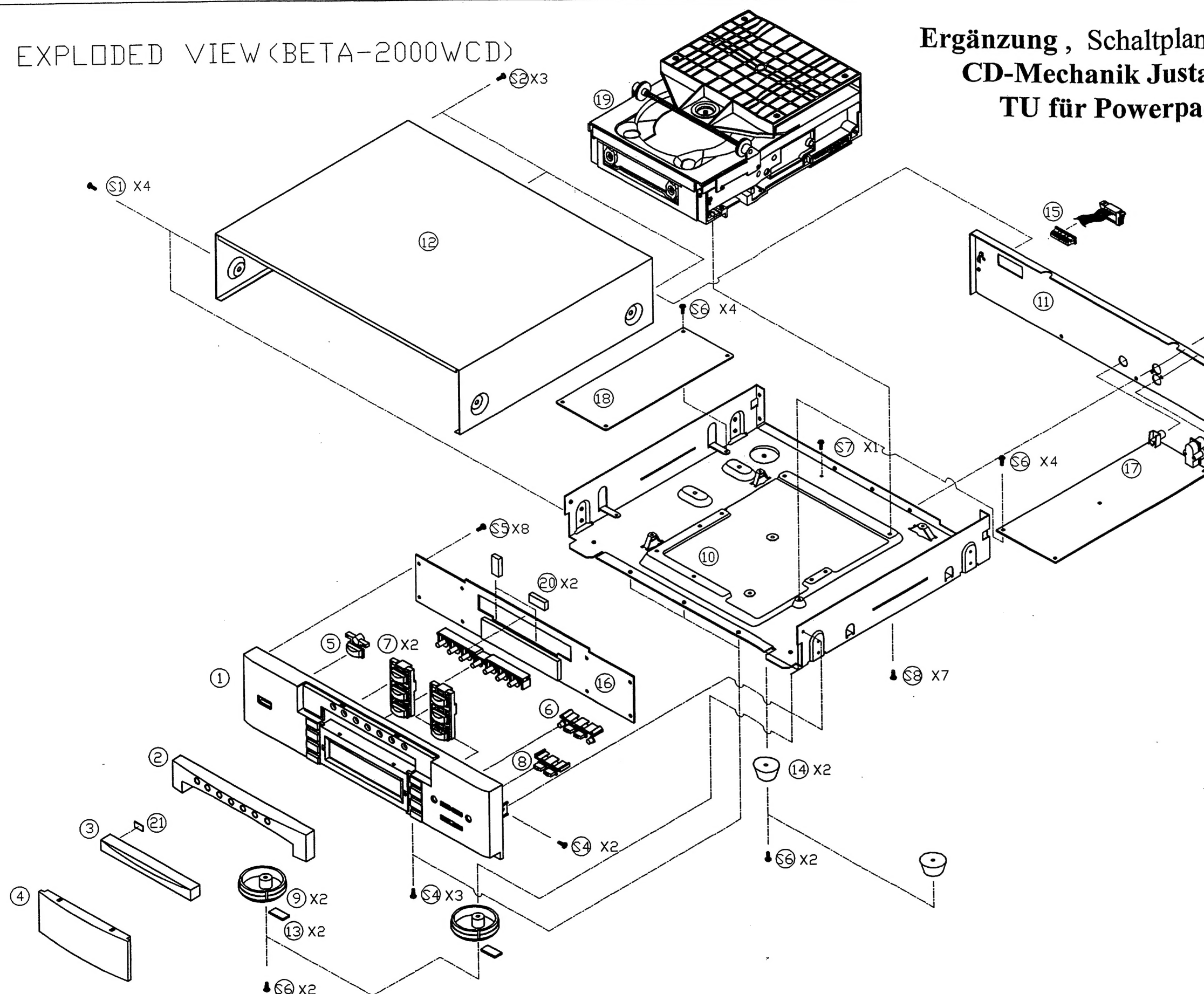
# 185.330-8

## VTCF-150A

### Beta 2000 W

EXPLODED VIEW (BETA-2000WCD)

**Ergänzung , Schaltplan für 7 fach CD-Wechsler**  
**CD-Mechanik Justage siehe QBNr. 036.656**  
**TU für Powerpack siehe QBNr. 037.021**



Best.Nr.: 1853308/01  
Ger.Bez.: UNIVERSUM-TURM  
GKz: G GERAET  
WGT: 659 KOMPLETTE STEREO-TUERME  
KD-Sektor: R RUNDUNK  
BaumNr.: 00 KEIN DIAGNOSEBAUM VORHANDEN  
Klassierung: STK STEREOKOMBINATION  
IFW-FehlerGru.: 205 RDF., VERST., TB., PHONO, CD, CB  
Type/Privileg/Universum.Nr VTCF-150A  
Beschreibung M.7CD-WECHSLER  
VK-Preis: 1399.00

Serviceart: 01 QUELLE-TKD  
Garantie fuer Kunden 06 Monate  
Sondervereinbarungen: 0 SIEHE SERVICEART  
Garantiereparatur 9999999 QUELLE  
Sondervereinbarungen: 0 SIEHE SERVICEART

Katalog	Seite
Erst 983 SONDERKATALOGE F/S 98	0000
Letzt 000	0000

Geraete Info:  
POWERPACK OHNE CD IST BAUGLEICH MIT QBNR.037.021  
CD-JUSTAGE SIEHE QBNR. 036.656

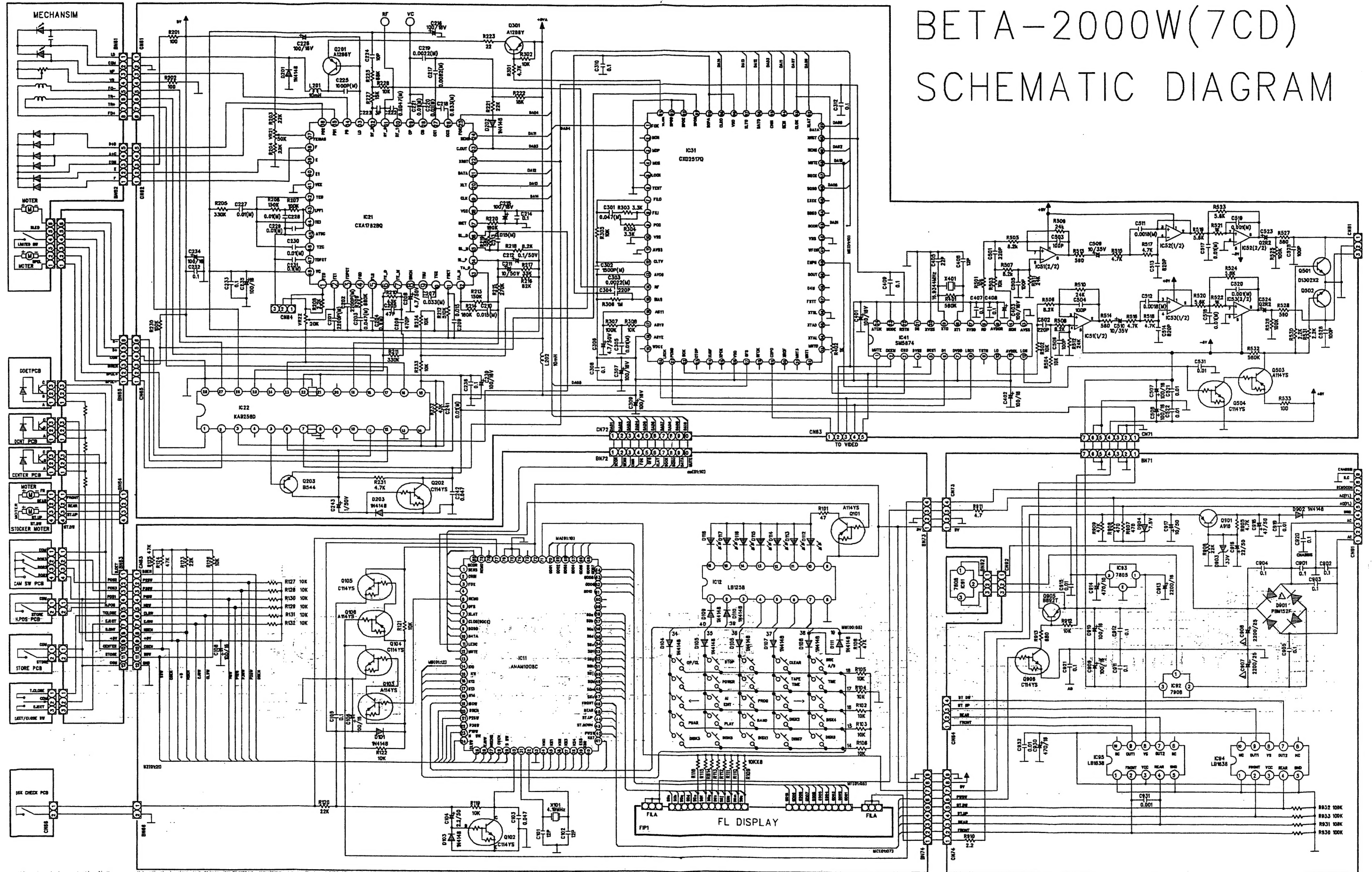
Technische Daten:

Fehler:-

- 1 7-CD-WECHSLER OHNE FUNKTION  
FEHLER: CD-WECHSLER OHNE FUNKTION  
URSACHE: MASSEVERBINDUNG UEBER TONLEITUNG (CINCH)  
ABHILFE: VERBINDUNG (CINCH) HERSTELLEN
- 2 PICKUP NACH AUSTAUSCH OHNE FUNKTION  
KURZSCHLUSSBRUECKEN BEI WECHSELMECHANIKEN ETRN.  
0410753 UND 0334599 MUESSEN AM 8POL-ANSCHLUSS  
(CN801) PIN 1 - PIN 2 DER CONNECTOR-PLATINE SIO-10  
ENTFERNET WERDEN.  
ACHTUNG,BEI MANCHEN NEUGERAETEN WURDE FESTGESTELLT  
DAS AUCH HIER DIE BRUECKEN NOCH GELOETET SIND !!!

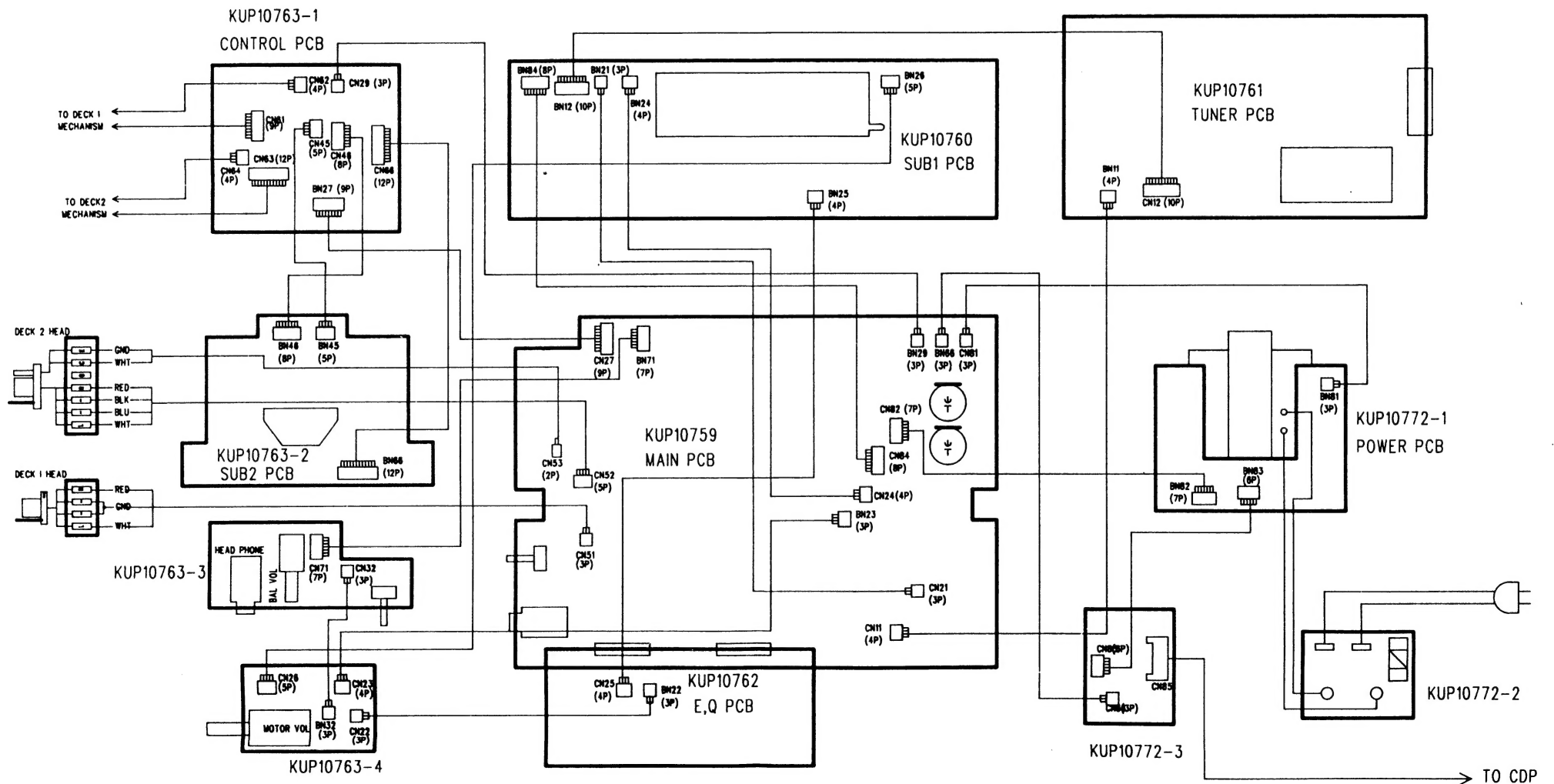


# BETA-2000W(7CD) SCHEMATIC DIAGRAM





## ■ WIRING DIAGRAM



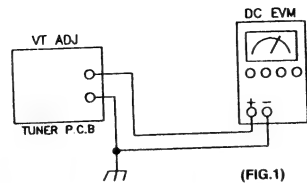


## MEASUREMENTS AND ADJUSTMENTS

### MW/FM

#### TUNING FREQUENCY RANGE ADJUSTMENT

1. Test equipment connection is shown in figure 1.
2. Set the unit to the desired band(FM, MW)
3. Place the radio frequency to 108MHz for FM, 600KHz for MW.
4. Adjust L7 for FM, L103 for MW so that the DC voltage is 8.0V for FM, 1.2V for MW.

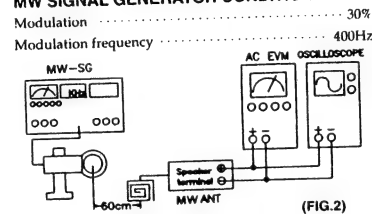


#### MW RF ADJUSTMENT

1. Test equipment connection is shown in figure 2.
2. Set the unit to "MW" position.
3. Place the radio frequency display and signal generator setting to 612KHz for MW.
4. Adjust L104 for maximum output.
5. Place the radio frequency display and signal generator setting to 1500KHz for MW.
6. Adjust CT02 for maximum output.
7. Repeat steps 3 - 6.
8. Adjust LF01 for maximum output.

Note: Antenna input level must be as low as possible being free from AGC.

#### MW SIGNAL GENERATOR CONDITION



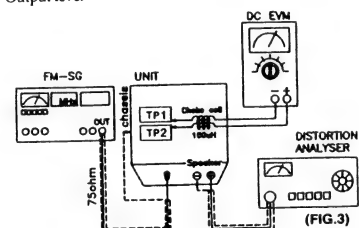
#### FM MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure 3.
2. Set the unit to "FM" position.
3. Place the radio frequency display and signal generator setting to 100.10MHz.
4. Adjust T102 core so that voltage measured in signal mode is 0mV(0±30mV) in range.
5. Adjust T101 so that the distortion factor of L-ch is minimized.
6. Repeat steps 4 and 5 a few times.
7. Make sure that the distortion factors of L-ch and R-ch nearly the same with each other to minimum.

Note: The adjusting screwdriver used should be made of ceramic.

#### FM SIGNAL GENERATOR CONDITION

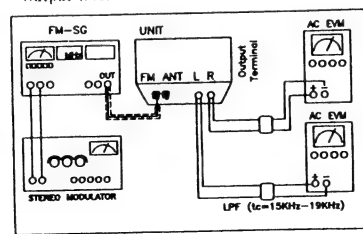
Modulation ..... 100%  
Modulation frequency ..... 400Hz  
Output level ..... 66dB



#### FM STEREO OPERATION ADJUSTMENT

1. Test equipment connection is shown in figure 4.
2. Set the unit to "FM" position.
3. Place the radio frequency display and signal generator setting to 100.1 MHz.
4. STEREO MODULATION setting MODE "STEREO"
5. Adjust VR 03 for Lch and Rch operation maximum.

FM SIGNAL GENERATOR CONDITION  
Modulation ..... L CH or R CH 45%, Pilot 10%  
Modulation frequency ..... 1KHz, Pilot (19KHz)  
Output level ..... 66dB



### \*CASSETTE

#### MEASUREMENT CONDITION:

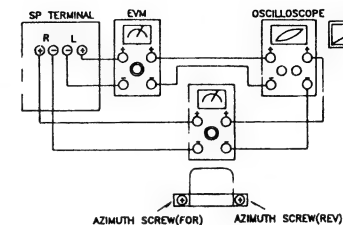
- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.

#### TEST TAPE:

- Head azimuth adjustment(10KHz, -10dB) : TCC-153
- Tape speed adjustment(3KHz, -10dB) : TCC-112
- Normal reference blank : TCC-103A
- Dolby level adjustment (330Hz, 0dB) : MTT-150

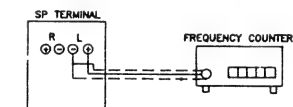
#### HEAD AZIMUTH ADJUSTMENT(TAPE I, I)

1. Test equipment connection is shown in figure.
2. Playback the azimuth adjusted part(10KHz, -10dB) of the test tape(TCC-153) and regulate the angle adjusting screw so that the outputs of L-ch and R-ch are maximized.  
(When the adjusting positions are different with L-ch and R-ch, find and position where are the outputs of L-ch and R-ch are balanced, and then mark the adjustment.)
3. At the same time, draw a lissajous waveform and eliminate phase deflection.
4. After the adjustment, apply screw-lock to the angle adjusting value.



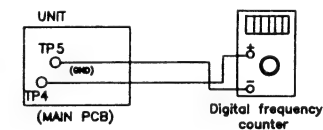
#### TEST SPEED ADJUSTMENT(TAPE I, I)

1. Test equipment connection is shown in figure.
2. Place unit into "TAPE" position.
3. Playback the test tape TCC-112.
4. Adjust first VR98(VR96) (TAPE I, I) for high speed (6000±120Hz) and then VR97(VR95) (TAPE I, I) for Normal speed (3000±60Hz)



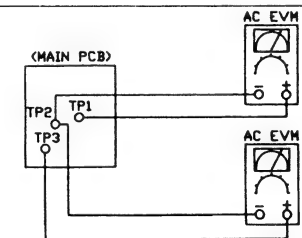
#### BIAS OSCILLATION ADJUSTMENT (TAPE II)

1. Test equipment connection is shown in figure.
2. Set the unit to "TAPE" position.
3. Insert a CrO2 tape and then press the record and pause button.
4. Adjust LS10 for 105KHz on frequency counter reading.



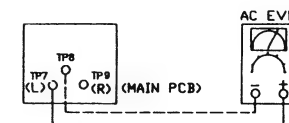
#### RECORDING BIAS ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "TAPE" Position.
3. Insert a Metal tape and set the cassette deck to "REC" mode.
4. Adjust SVR 8(L-ch) and SVR7(R-ch) for recording bias so that voltage in signal is 1400uA
5. At the same time, check CrO2 tape(800uA) and Normal tape (600uA)



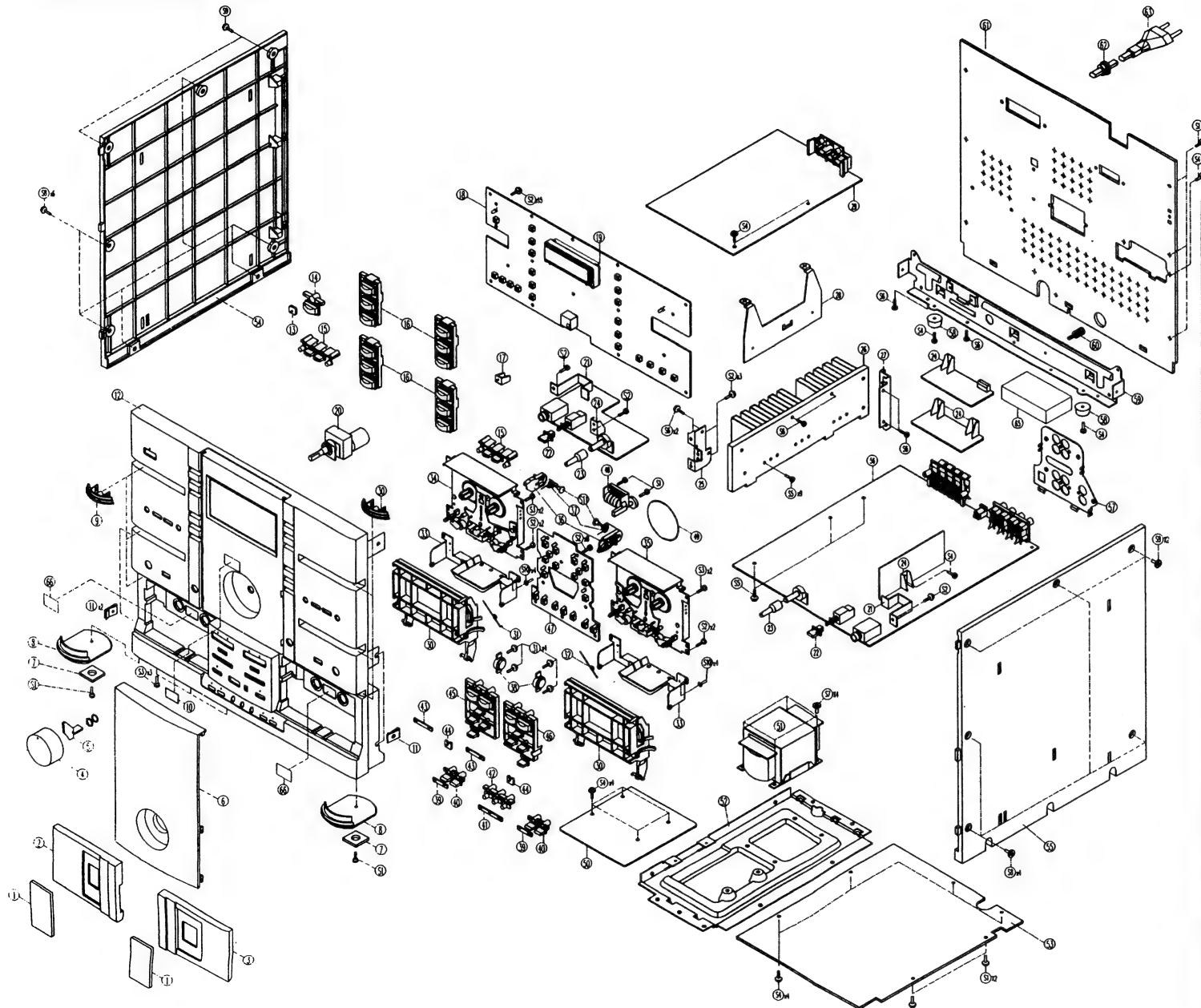
#### PLAYBACK GAIN ADJUSTMENT

1. Playback the playback gain adjust part (400Hz, 200mVb) of the test tape (MTT-150)
2. DECK I — L-CH Adj point : SVR2  
— R-CH Adj point : SVR1  
DECK II — L-CH Adj point : SVR4  
— R-CH Adj point : SVR3  
So that AC mV meter will become 580mV.





## ■ EXPLODED VIEW

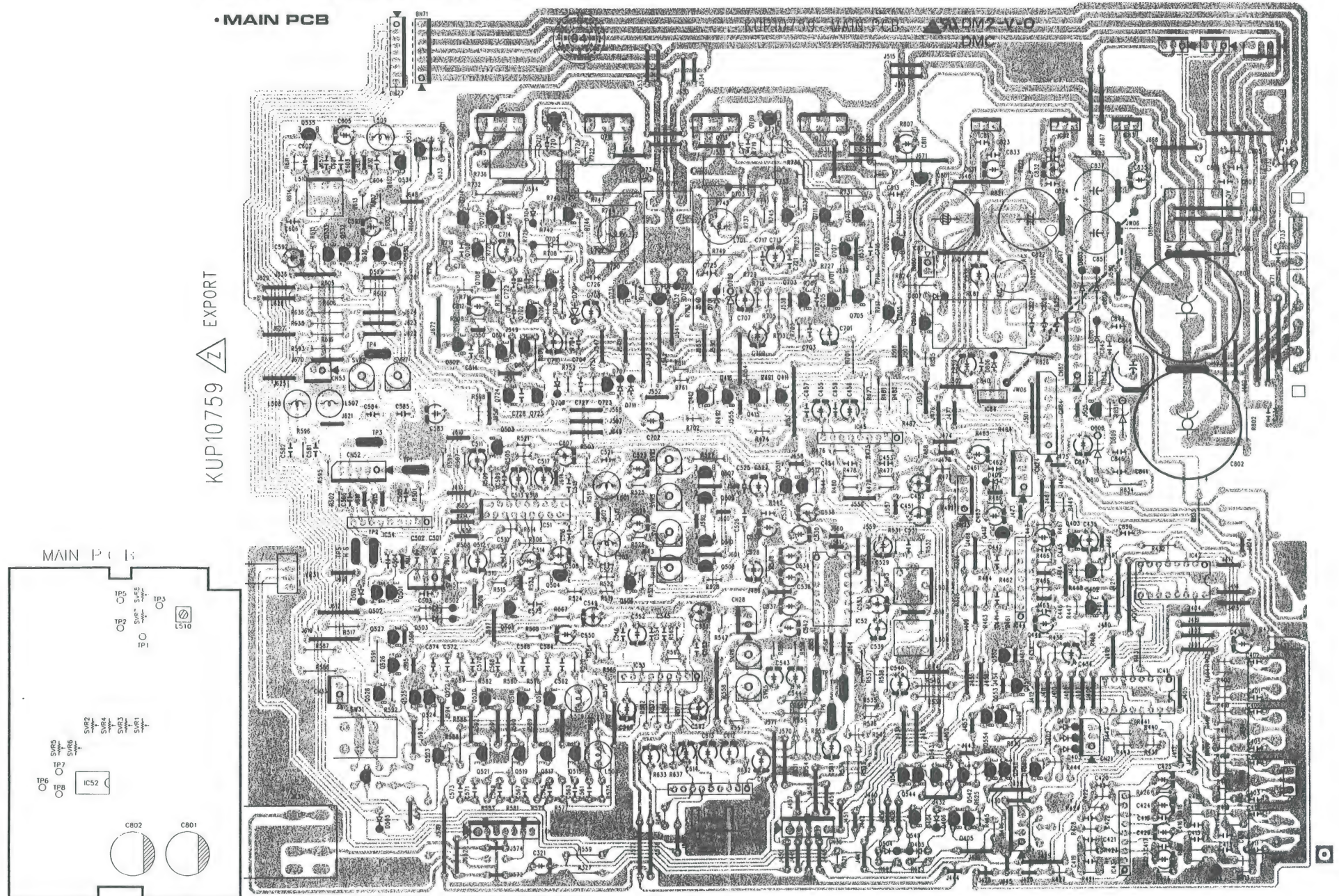


NO.	DESCRIPTION	PARTS-NO.	QTY	MATERIAL	REMARK
1	1ST WINDOW	K01A025	2	ABS	
2	DOOR BASE L	K01A027	1	ABS	
3	DOOR BASE R	K01A028	1	ABS	
4	VOLUME POWER	K01A041	1	ABS	
5	VOLUME INDICATOR	K01A045	1	ACRIL	
6	1ST WINDOW	K01A075	1	ACRIL	
7	FOOT CHASSIS	K01A050	2	FEEL	
8	FRONT FOOT	K01A044	1	ABS	
9	FOOT	K01A009	4	ABS	
10	REMOCON FILTER	K01A005	1	PVC	
11	1-BIT	K01A001	1	SWISS L=0.6	
12	FRONT PANEL	K01A018	1	H-PS	
13	FLAT INDICATOR	K01A020	1	ACRIL	
14	POWER LOCK	K01A020	1	ABS	
15	FLAT WINDOW (L)	K01A020	2	ABS	
16	LACT WINDOW	K01A020	2	ABS	
17	INDICATOR	K01A001	1	ACRIL	
18	SUB-1 PCB ASSY	K01A047	1	PC-1	
19	1ST WINDOW	K01A027	2	SPIN L=0.5	
20	VOLUME	K01A020	1	ABS	
21	PCB BRACKET	K01A010	1	SCOT L=1.0	
22	POWER LOCK	K01A045	1	ABS	
23	POWER BRACKET	K01A047	1	ABS	
24	BALANCE WINDOW	K01A040	1	SPIN L=0.5	
25	2-ND WINDOW	K01A020	1	ABS	
26	2-ND WINDOW (L)	K01A020	1	ABS	
27	FLAT WINDOW	K01A020	1	ABS	
28	POWER BRACKET	K01A047	1	ABS	
29	POWER PCB ASSY	K01A047	1	PC-1	
30	1ST HOLDER	K01A027	1	UPPER (OP-200)	
31	1ST OPEN SPRING L	K01A020	1	SUS304PH	
32	1ST OPEN SPRING R	K01A020	1	SUS304PH	
33	REMOCON BRACKET	K01A020	1	SUS304PH	
34	2-ND PCB MECHANISM	K01A020	1	SCOT L=1.6	
35	2-ND PCB MECHANISM	K01A020	1	SCOT L=1.6	
36	DOOR LOCK	K01A003	2	POW	
37	LOCK SPRING	K01A003	2	SUS304PH	
38	DOOR LOCK	K01A003	2	SUS304PH	
39	INDICATOR (L)	K01A020	2	ACRIL	
40	LACT WINDOW (L)	K01A020	2	ABS	
41	INDICATOR (R)	K01A020	2	ACRIL	
42	LACT WINDOW (R)	K01A020	2	ABS	
43	FLAT INDICATOR	K01A020	2	ACRIL	
44	FLAT INDICATOR	K01A020	2	ACRIL	
45	LACT WINDOW	K01A020	2	ABS	
46	LACT WINDOW	K01A020	2	ABS	
47	SUB-2 PCB	K01A020	1	PC-1	
48	APC COUNTER	K01A020	1	RUBBER	
49	COUNTER BELL	K01A020	1	RUBBER	
50	SUB-2 PCB	K01A020	1	PC-1	
51	POWER BRANK	K01A020	1	SCOT L=1.2	
52	POWER BRANK	K01A020	1	SCOT L=1.2	
53	POWER BRANK	K01A020	1	SCOT L=1.2	
54	POWER BRANK	K01A020	1	SCOT L=1.2	
55	POWER BRANK	K01A020	1	SCOT L=1.2	
56	POWER BRANK	K01A020	1	SCOT L=1.2	
57	POWER BRANK	K01A020	1	SCOT L=1.2	
58	POWER BRANK	K01A020	1	SCOT L=1.2	
59	POWER BRANK	K01A020	1	SCOT L=1.2	
60	POWER BRANK	K01A020	1	SCOT L=1.2	
61	POWER BRANK	K01A020	1	SCOT L=1.2	
62	POWER BRANK	K01A020	1	SCOT L=1.2	
63	POWER BRANK	K01A020	1	SCOT L=1.2	
64	POWER BRANK	K01A020	1	SCOT L=1.2	
65	POWER BRANK	K01A020	1	SCOT L=1.2	
66	POWER BRANK	K01A020	1	SCOT L=1.2	
67	POWER BRANK	K01A020	1	SCOT L=1.2	
68	POWER BRANK	K01A020	1	SCOT L=1.2	
69	POWER BRANK	K01A020	1	SCOT L=1.2	
70	POWER BRANK	K01A020	1	SCOT L=1.2	
71	POWER BRANK	K01A020	1	SCOT L=1.2	
72	POWER BRANK	K01A020	1	SCOT L=1.2	
73	POWER BRANK	K01A020	1	SCOT L=1.2	
74	POWER BRANK	K01A020	1	SCOT L=1.2	
75	POWER BRANK	K01A020	1	SCOT L=1.2	
76	POWER BRANK	K01A020	1	SCOT L=1.2	
77	POWER BRANK	K01A020	1	SCOT L=1.2	
78	POWER BRANK	K01A020	1	SCOT L=1.2	
79	POWER BRANK	K01A020	1	SCOT L=1.2	
80	POWER BRANK	K01A020	1	SCOT L=1.2	
81	POWER BRANK	K01A020	1	SCOT L=1.2	
82	POWER BRANK	K01A020	1	SCOT L=1.2	
83	POWER BRANK	K01A020	1	SCOT L=1.2	
84	POWER BRANK	K01A020	1	SCOT L=1.2	
85	POWER BRANK	K01A020	1	SCOT L=1.2	
86	POWER BRANK	K01A020	1	SCOT L=1.2	
87	POWER BRANK	K01A020	1	SCOT L=1.2	
88	POWER BRANK	K01A020	1	SCOT L=1.2	
89	POWER BRANK	K01A020	1	SCOT L=1.2	
90	POWER BRANK	K01A020	1	SCOT L=1.2	
91	POWER BRANK	K01A020	1	SCOT L=1.2	
92	POWER BRANK	K01A020	1	SCOT L=1.2	
93	POWER BRANK	K01A020	1	SCOT L=1.2	
94	POWER BRANK	K01A020	1	SCOT L=1.2	
95	POWER BRANK	K01A020	1	SCOT L=1.2	
96	POWER BRANK	K01A020	1	SCOT L=1.2	
97	POWER BRANK	K01A020	1	SCOT L=1.2	
98	POWER BRANK	K01A020	1	SCOT L=1.2	
99	POWER BRANK	K01A020	1	SCOT L=1.2	
100	POWER BRANK	K01A020	1	SCOT L=1.2	



# ■ PRINTED CIRCUIT BOARDS

## • MAIN PCB

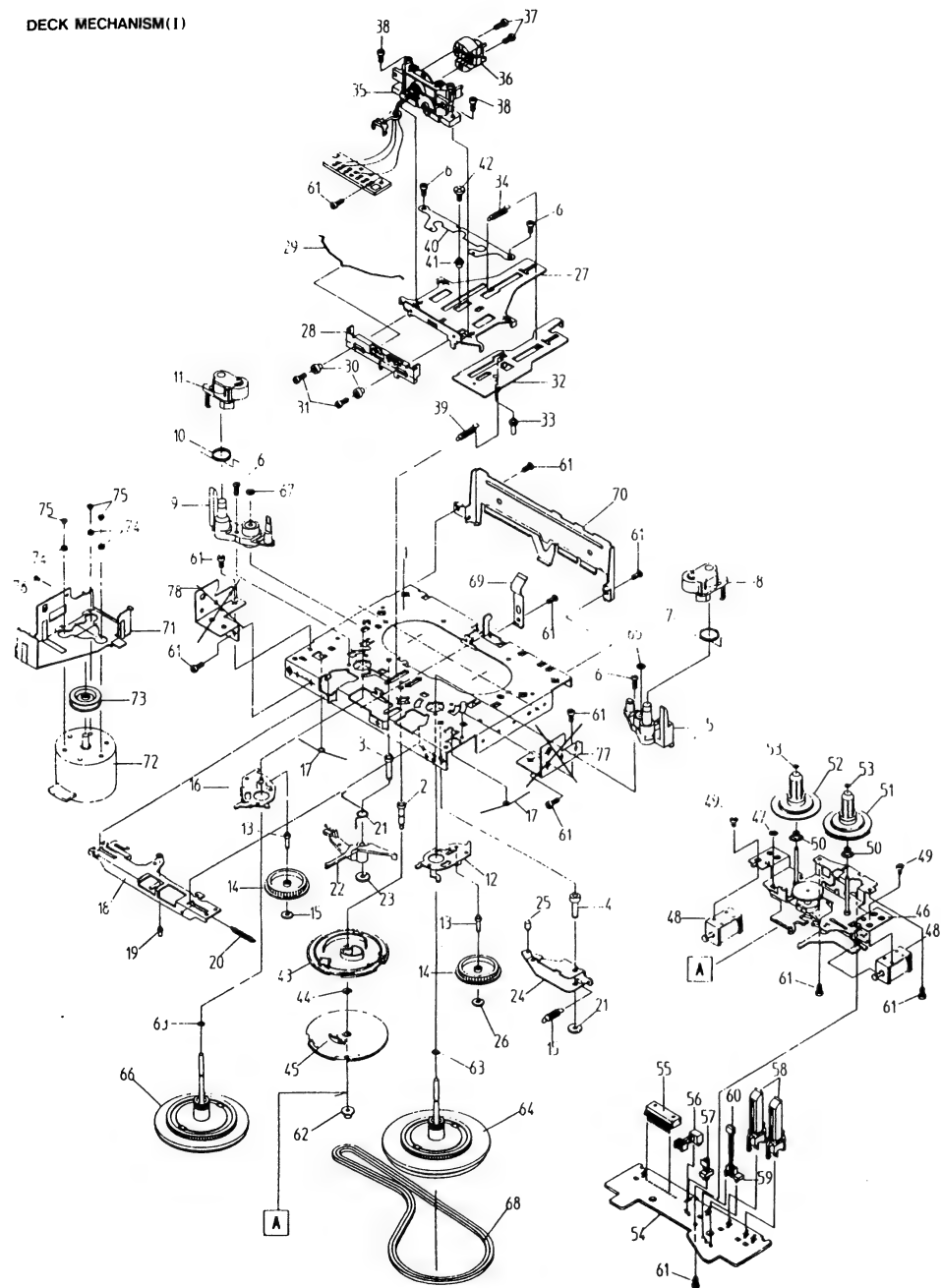




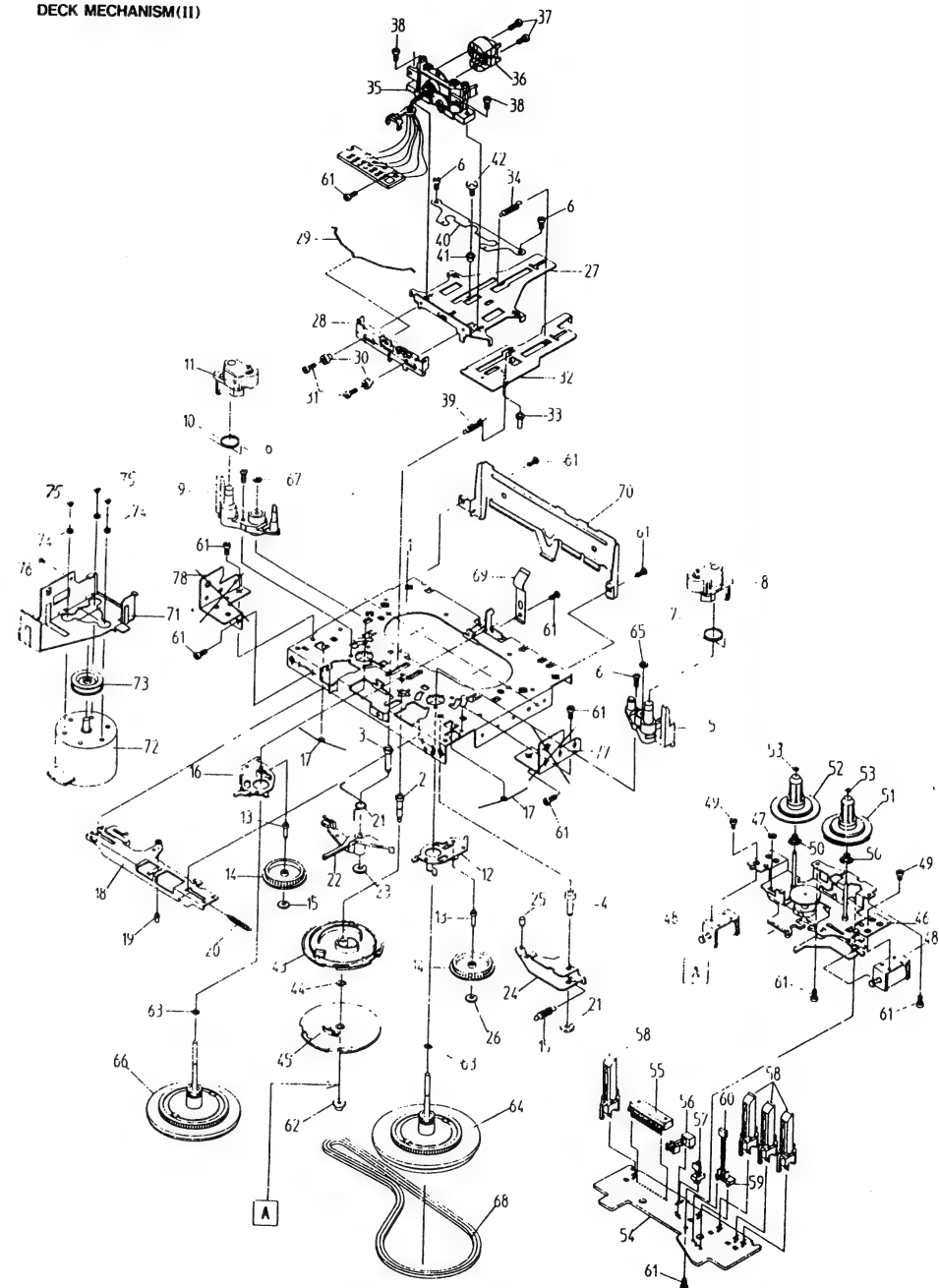
Pin	L	H
9 OUT 0	TUNER	
10 OUT 1	MUTE	
11 OUT 2	AM	FM
12 OUT 3	MW	LW
13 OUT 4	MONO	STEREO
14 OUT 5	(H) SD	(L)SD
17 OUT 6	(IF) STOP	



DECK MECHANISM(I)



DECK MECHANISM(II)



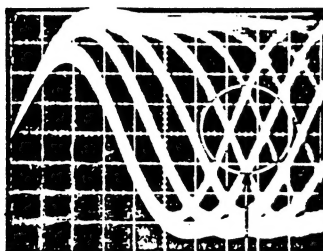


## MEASUREMENTS AND ADJUSTMENTS

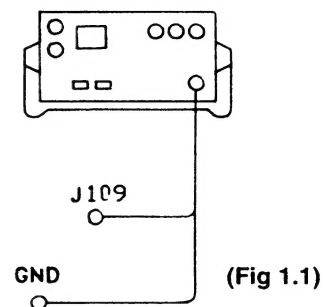
- Oscilloscope .....1
- Signal Generator .....1
- TEST DISC 5A(PHILIPS) .....1
- Plastic drive(1.4mm) .....1
- VTVM .....1

### 1. FOCUS OFF SET ADJUSTMENT

1. Test equipment connection is shown is Fig 1.1.
2. Play the test disc.
3. Adjust VR91 so that the eye pattern of RF Signal is open widest. (Fig 1.2)



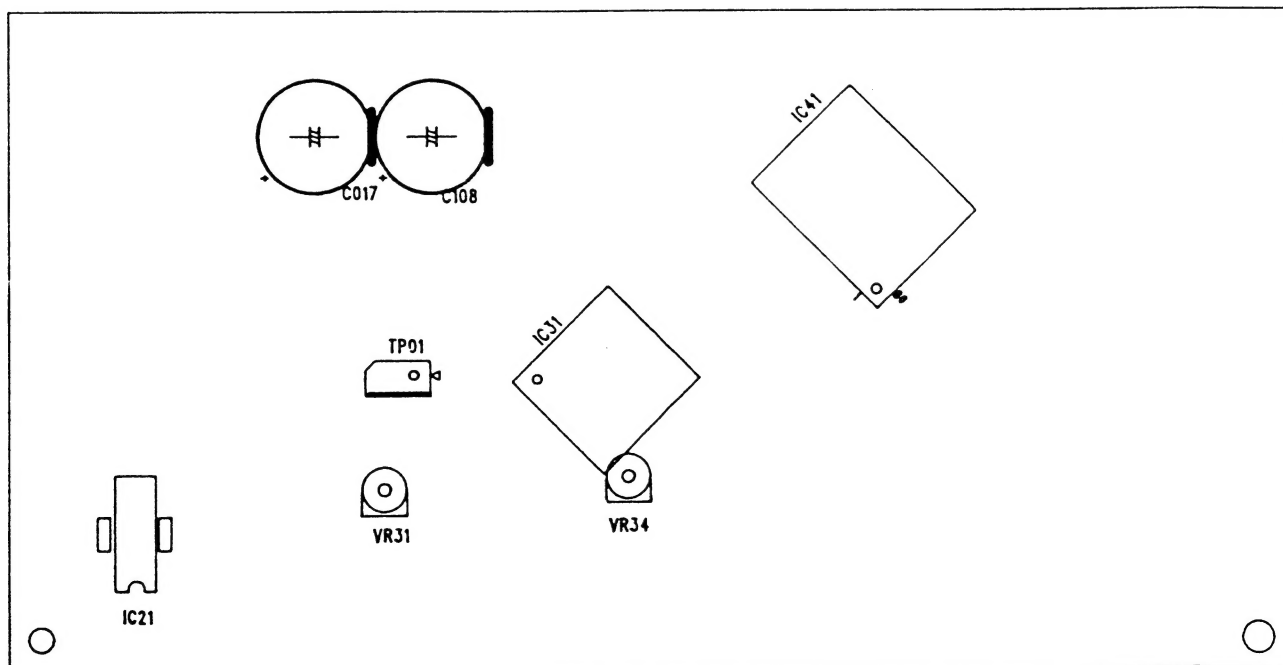
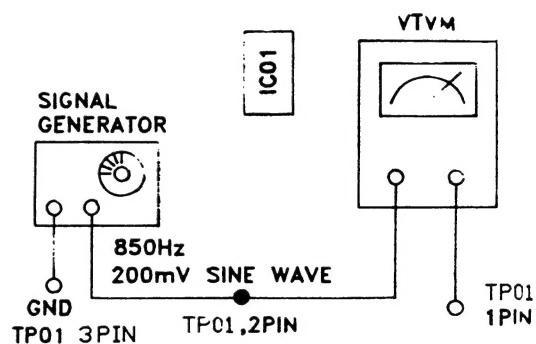
(Fig 1.2)



(Fig 1.1)

### 2. FOCUS GAIN ADJUSTMENT

1. Test equipment connection is shown is Fig 2.
2. Play the test disc.
3. Adjust VR93 until monitor level at VTVM becomes 400mV (AC).

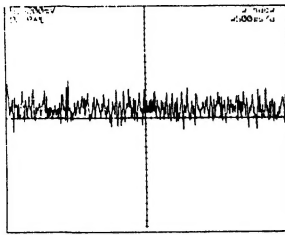




## WAVE FORMS

### 1 FE-O

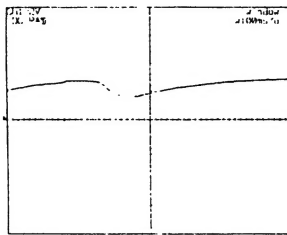
(TEST POINT : IC31-PIN6)  
Focus Drive Output



P-P 368mV AVG 112mV FALL 85mS  
MAX 320mV UNDSHT 43% FREQ 7.142kHz  
MIN -48mV OVRSH 57% PERIOD 140mS  
RMS 132mV RISE 10mS +WIDTH 50mS  
-WIDTH 90mS

### 2 SRCH

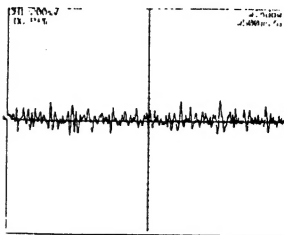
(TEST POINT : IC31-PIN8)  
PIN for Providing a time constant to generate the focus search waveform.



P-P 1.44V AVG 2.32V FALL 52mS  
MAX 2.96V UNDSHT 15% -WIDTH 232mS  
MIN 1.52V OVRSH 23%  
RMS 2.40V RISE 244mS

### 3 TA-O

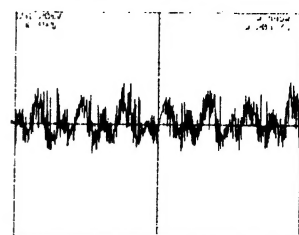
(TEST POINT : IC31-PIN13)  
Tracking drive output



P-P 280mV AVG 8mV FALL 15mS  
MAX 152mV UNDSHT 67% FREQ 4.000kHz  
MIN 128mV OVRSH 67% PERIOD 250mS  
RMS 44mV RISE 75mS +WIDTH 70mS  
-WIDTH 180mS

### 4 SL-P

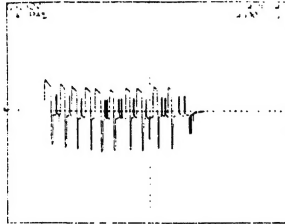
(TEST POINT : IC31-PIN14)  
Inverse input pin for the sled Amplifier.



P-P 53.6mV AVG 1.6mV FALL 1.2mS  
MAX 31.2mV UNDSHT 27% FREQ 48.07MHz  
MIN 22.4mV OVRSH 27% PERIOD 21.0mS  
RMS 10.4mV RISE 4.2mS +WIDTH 14.0mS  
-WIDTH 7.0mS

### 5 SL-O

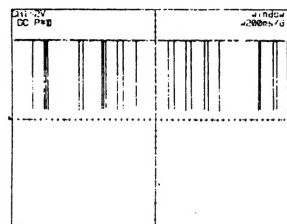
(TEST POINT : IC31-PIN16)  
Sled drive output



P-P 5.28V AVG 80mV FALL 5mS  
MAX 2.32V UNDSHT 73% FREQ 7.692Hz  
MIN -2.96V OVRSH 127% PERIOD 130mS  
RMS 960mV RISE 55mS +WIDTH 120mS  
-WIDTH 30mS

### 6 CLK

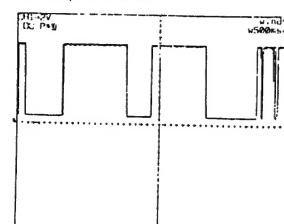
(TEST POINT : IC31-PIN19)  
Serial data Transfer Clock input from CPU



P-P 5.28V AVG 5.60V FALL 2mS  
MAX 5.84V UNDSHT 2% FREQ 25.00Hz  
MIN 5.60mV OVRSH 2% PERIOD 40mS  
RMS 5.72V RISE 2mS +WIDTH 38mS  
-WIDTH 2mS

### 7 XLT

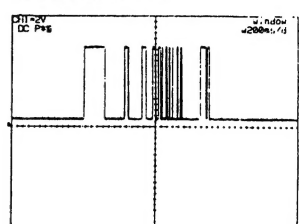
(TEST POINT : IC31-PIN20)  
Latch input from CPU



P-P 5.28V AVG 3.76V FALL 5mS  
MAX 5.84V UNDSHT 0% FREQ 1.030Hz  
MIN 5.60mV OVRSH 0% PERIOD 970mS  
RMS 4.56V RISE 5mS +WIDTH 80mS  
-WIDTH 890mS

### 8 DATA

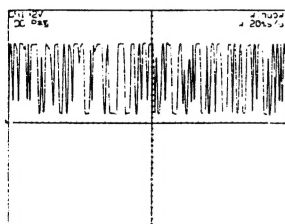
(TEST POINT : IC31-PIN21)  
Serial data input from CPU.



P-P 5.36V AVG 1.04V FALL 5mS  
MAX 5.84V UNDSHT 2% FREQ 31.25Hz  
MIN 4.80mV OVRSH 2% PERIOD 34mS  
RMS 1.92V RISE 2mS +WIDTH 16mS  
-WIDTH 18mS

### 9 C.COUNT

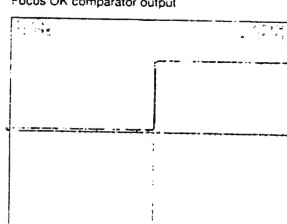
(TEST POINT : IC31-PIN23)  
Track number count signal output.



P-P 5.20V AVG 3.26V FALL 1.0mS  
MAX 5.76V UNDSHT 3% FREQ 138.8Hz  
MIN 5.60mV OVRSH 2% PERIOD 7.2mS  
RMS 1.95V RISE 1.8mS +WIDTH 8.0mS  
-WIDTH 1.2mS

### 10 FOK

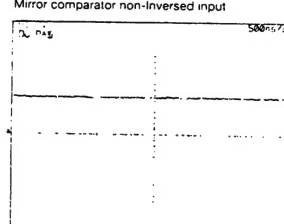
(TEST POINT : IC31-PIN25)  
Focus OK comparator output



P-P 5.12V AVG 3.64V FALL 0mS  
MAX 5.20V UNDSHT 0% FREQ 25.00Hz  
MIN 80mV OVRSH 3% PERIOD 10mS  
RMS 80mV RISE 10mS

### 11 CP

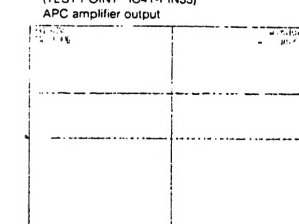
(TEST POINT : IC31-PIN29)  
Mirror comparator non-Inversed input



P-P 160mV AVG 2.64V FALL 5mS  
MAX 2.72V UNDSHT 0% FREQ 8.333kHz  
MIN 2.56V OVRSH 100% PERIOD 120mS  
RMS 2.68V RISE 5mS +WIDTH 10mS  
-WIDTH 10mS

### 12 LD

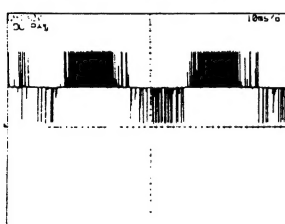
(TEST POINT : IC41-PIN33)  
APC amplifier output



P-P 160mV AVG 3.20V FALL 0mS  
MAX 3.36V UNDSHT 0% FREQ 25.00MHz  
MIN 3.20V OVRSH 100% PERIOD 40mS  
RMS 3.24V RISE 20mS +WIDTH 20mS  
-WIDTH 20mS

### 13 MDP

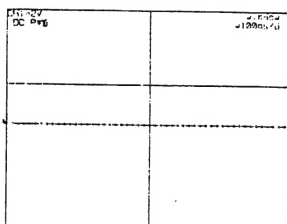
(TEST POINT : IC41-PIN3)  
Output for spindle motor servo control.



P-P 5.28V AVG 2.88V FALL 0mS  
MAX 5.44V UNDSHT 6% FREQ 1.665kHz  
MIN 3.12V OVRSH 106% PERIOD 600mS  
RMS 3.12V RISE 100mS +WIDTH 500mS  
-WIDTH 100mS

### 14 CLTV

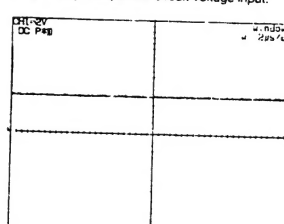
(TEST POINT : IC41-PIN12)  
VCO control voltage input for master PLL



P-P 80mV AVG 2.72V FALL 0mS  
MAX 2.80V UNDSHT 0% FREQ 500.0Hz  
MIN 2.72V OVRSH 0% PERIOD 3mS  
RMS 2.76V RISE 1mS +WIDTH 1mS  
-WIDTH 2mS

### 15 ASY1

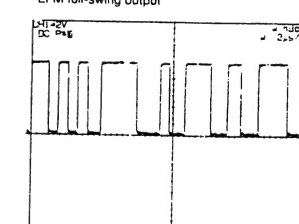
(TEST POINT : IC41-PIN16)  
Asymmetry Comparator circuit voltage input.



P-P 160mV AVG 2.56V FALL 0mS  
MAX 2.72V UNDSHT 0% FREQ 25.00MHz  
MIN 2.56V OVRSH 100% PERIOD 40mS  
RMS 2.60V RISE 20mS +WIDTH 20mS  
-WIDTH 20mS

### 16 ASY0

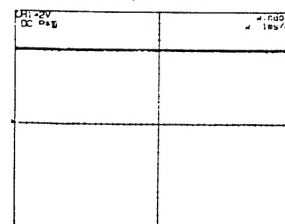
(TEST POINT : IC41-PIN17)  
EFM full-swing output



P-P 5.20V AVG 2.96V FALL 20mS  
MAX 5.20V UNDSHT 2% FREQ 735.2kHz  
MIN 0mV OVRSH 100% PERIOD 1.38mS  
RMS 3.88V RISE 40mS +WIDTH 680mS  
-WIDTH 680mS

### 17 GFS

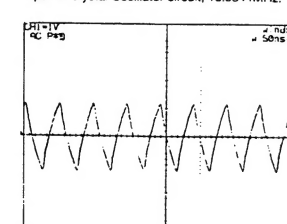
(TEST POINT : IC41-PIN27)  
Indicates the frame sync lock status



P-P 400mV AVG 5.20V FALL 50mS  
MAX 5.44V UNDSHT 33% FREQ 1.020kHz  
MIN 5.04V OVRSH 33% PERIOD 980mS  
RMS 5.28V RISE 10mS +WIDTH 970mS  
-WIDTH 970mS

### 18 XTAL

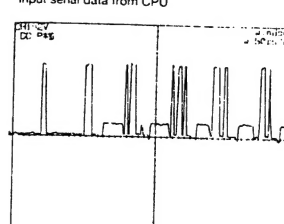
(TEST POINT : IC41-PIN34)  
Input to crystal Oscillator circuit, 16.9344MHz.



P-P 2.40V AVG -40mV FALL 4mS  
MAX -1.16V UNDSHT 4% FREQ 16.934MHz  
MIN -1.24V OVRSH 2% PERIOD 22.0mS  
RMS 700mV RISE 22.0mS

### 19 DATA

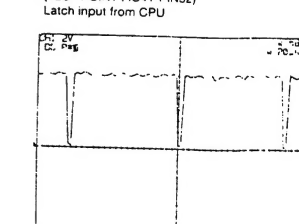
(TEST POINT : IC41-PIN51)  
Input serial data from CPU



P-P 5.44V AVG 1.28V FALL 1.5mS  
MAX 5.20V UNDSHT 8% FREQ 90.90kHz  
MIN 2.16V OVRSH 2% PERIOD 11.0mS  
RMS 2.16V RISE 1.5mS +WIDTH 5.0mS  
-WIDTH 6.0mS

### 20 XLAT

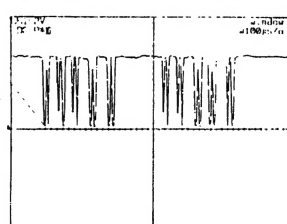
(TEST POINT : IC41-PIN52)  
Latch input from CPU



P-P 5.20V AVG 4.80V FALL 1.8mS  
MAX 5.36V UNDSHT 2% FREQ 13.51kHz  
MIN 160mV OVRSH 3% PERIOD 74.0mS  
RMS 5.00V RISE 1.8mS +WIDTH 70.0mS  
-WIDTH 4.0mS

### 21 CLOCK

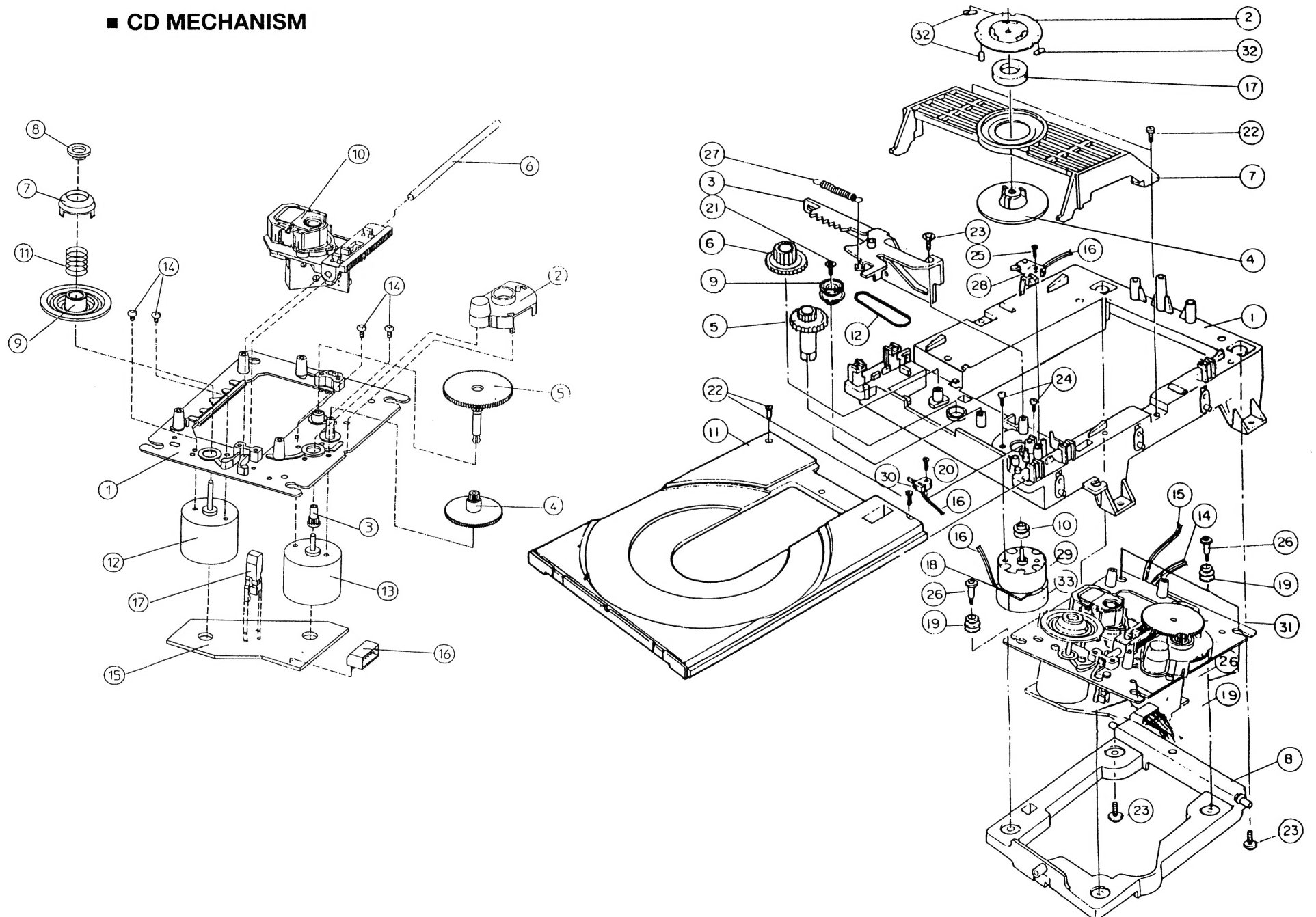
(TEST POINT : IC41-PIN53)  
Input serial data transfer clock from CPU.



P-P 5.12V AVG 4.40V FALL 5mS  
MAX 5.28V UNDSHT 2% FREQ 20.00kHz  
MIN 160mV OVRSH 2% PERIOD 50mS  
RMS 4.72V RISE 5mS +WIDTH 30mS  
-WIDTH 20mS

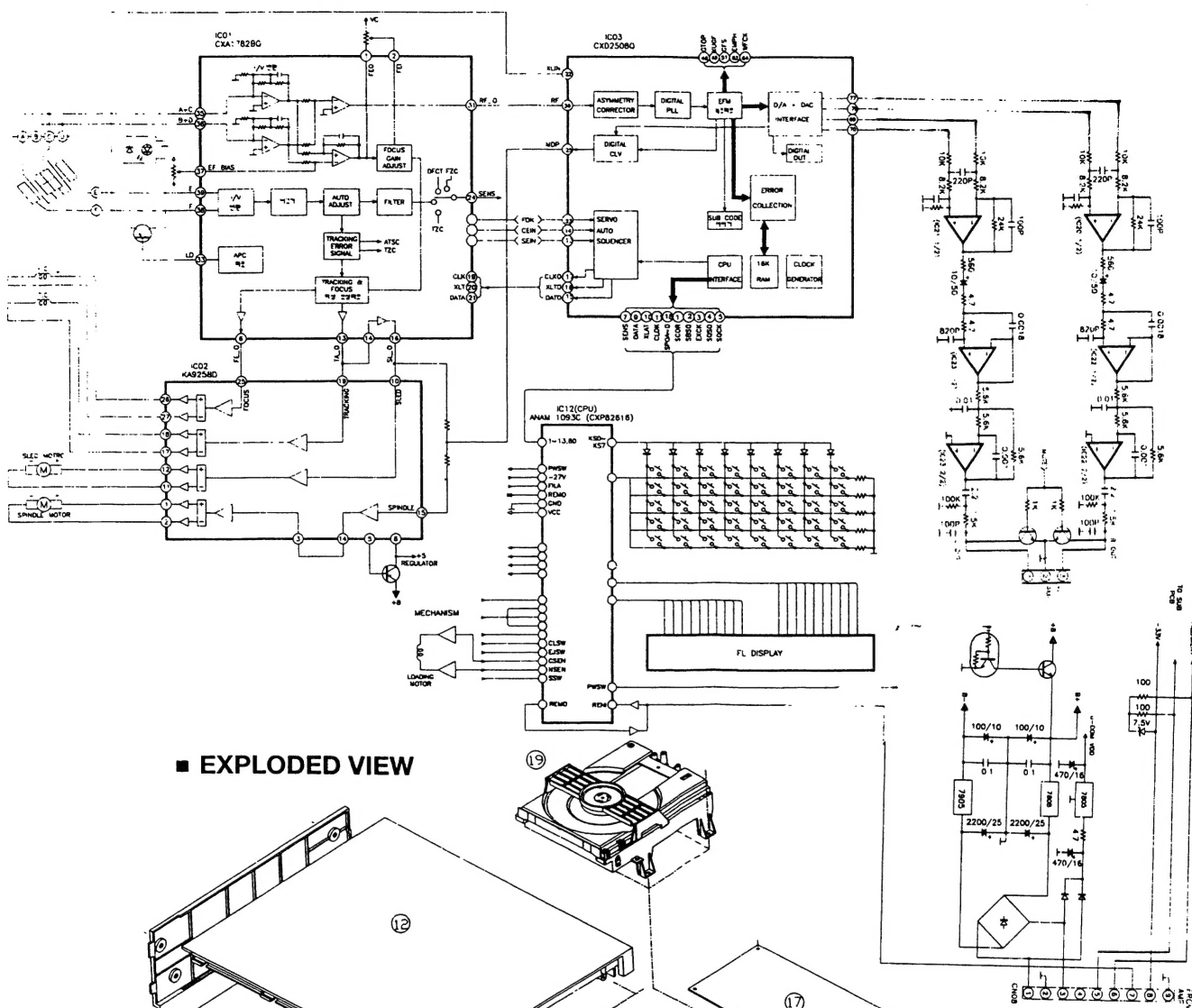


# ■ CD MECHANISM





## ■ BLOCK DIAGRAM



## ■ EXPLODED VIEW

